WISCONSIN DEPARTMENT OF NATURAL RESOURCES

FISH MANAGEMENT BUREAU
Administrative Report Number 4

January, 1974

An Analysis of Potential Fish Management Workload by Area

Richard R. Cornelius

Staff Specialist

AN ANALYSIS OF POTENTIAL FISH MANAGEMENT WORKLOAD BY AREA

Introduction

This report attempts to give some indication of the potential Fish Management workload in each administrative area of the state (Figure 1). While no attempt has been made to indicate specific positions or man-months needed for any area based on workload indicators, the figures arrived at in this report may be of use in comparing workloads between areas and thereby determining where future manpower additions may be needed.

It is realized that the method used in determining workload in this report is but one of many possible methods which could be used. Probably no two people would use exactly the same criteria in determining workload. Therefore, there is bound to be some disagreement with the results achieved here, and certainly these results should not be treated as the final authority.

Methods

The workload of any area in Fish Management is a result of many activities, such as demand for services (private hatchery investigations, public meetings, cooperation with other agencies), and the actual investigation and manipulation of the resource (surveys, fencing, chemical eradication). It would be difficult to determine the value of each of these activities in the overall workload scheme. Rather, it was felt that all these diverse activities were functions of two basic indicators: the population and size of the area (Service Requirement Indicator), and the amount and type of resources in the area (Resource Supply Indicator). It was decided each of these two indicators had equal weight in analyzing potential workload.

Service Requirement Indicator

The Service Requirement Indicator (SRI) is a function of population and area. The approximate resident population was determined for each area in the state. To calculate the impact of nonresidents, fishing license sales were used. Nonresident license sales accounted for about 40 percent of total license sales in 1972, so resident population was weighed 3/5 and nonresident license sales 2/5. The percent of the state resident population in each area was calculated (R), and the percent of the state's nonresident license sales was calculated for each area (N). The population indicator (P) was then calculated for each area as follows: $3R + 2N = P$.

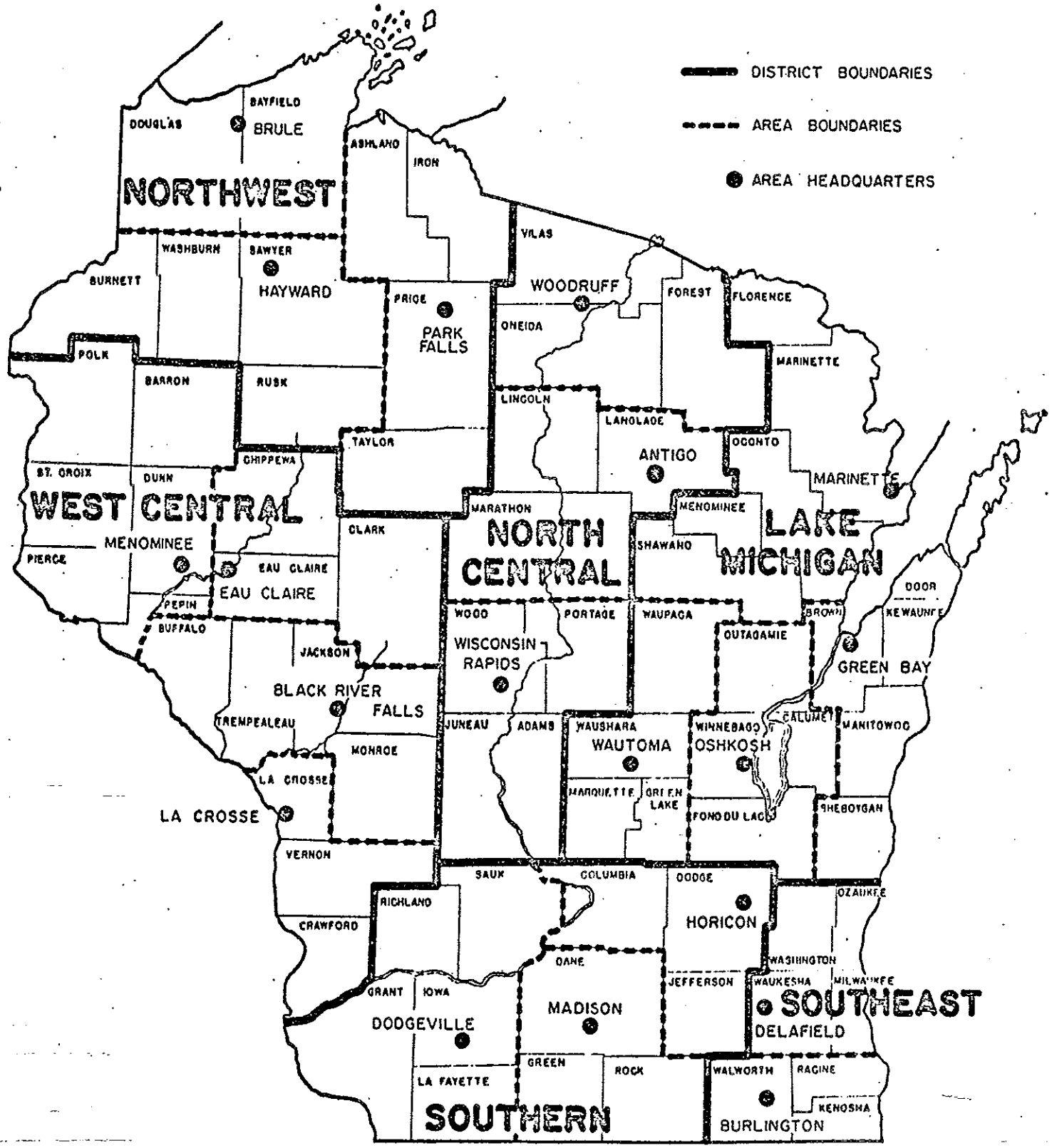


FIGURE 1. Fish Management Districts and Areas

The indicator P was then converted to a percentage, as are all following indicators. This was done so that each indicator would have equal weight in further calculations.

The percent of the total state land area within each area was calculated (A). It was decided that population should be weighed twice that of area; therefore, the Service Requirement Indicator (SR1) was calculated: $2P + A = SR1$ for each area.

Resource Supply Indicator

The Resource Supply Indicator (RS1) is a function of three resources: lakes, total streams, and trout streams.

In calculating the lake indicator (L), lakes in each area were grouped into size classes and the approximate water acreage was determined for each size class. As lakes increase in size, their recreational value increases, and consequently the demand generated for services and management increases. To reflect this trend, the acreage of each size class was multiplied by a factor. The acreage in the 0-9 acre size class was multiplied by one, the acreage in the 10-49 acre size class was multiplied by two, and so on up to the greater than 1,000 acre size class which was multiplied by seven. While these multipliers were rather arbitrarily chosen, they help indicate the increased fisheries demand as lake size increases.

Exceptions to this method were Lakes Superior, Michigan and Winnebago, whose large size negated valuing them in this manner. Lakes Superior and Michigan will be discussed separately, while the acreage of Lake Winnebago was not multiplied by a factor before it was added to the total acreage of the area.

The factored acreage of each lake size class was totaled for each area. This lake indicator (L) was then converted to a percentage.

The total stream indicator (S) was calculated in the same manner as the lake indicator. Streams in each area were divided into size classes and the acreage was factored (acreage of 0-9 feet width size class multiplied by one, up to acreage of greater than 40 feet width size class multiplied by four). The factored acreage of each stream size class was totaled for each area, and this total stream indicator (S) was then converted to a percentage. The Mississippi River, because of its size, was not included in these calculations, but will be treated separately.

In addition to the total stream indicator, it was decided to treat trout streams separately. This is because the fisheries value of a trout stream is usually far greater than of a warmwater stream of comparable size, and a large segment of the fisheries workload involves trout streams. Therefore, the true importance of trout streams would not be indicated if not treated separately from other streams.

The trout stream indicator (T) was calculated by figuring the miles of trout water in each area and converting this to a percentage of the total miles of trout stream in the state.

To figure the Resource Indicator (RS1), the lake indicator (L) was weighed 1/2, while the total streams indicator (S) and the trout stream indicator (T) were each weighed 1/4. Therefore: 2L + S + T = RS1 for each area.

Workload Indicator

To calculate the Workload Indicator (WL1) for each area, the Resource Supply Indicator (RS1) and Service Requirement Indicator (SR1) were converted to percentages to give them equal weight and then added. Therefore: RS1 + SR1 = WL1 for each area.

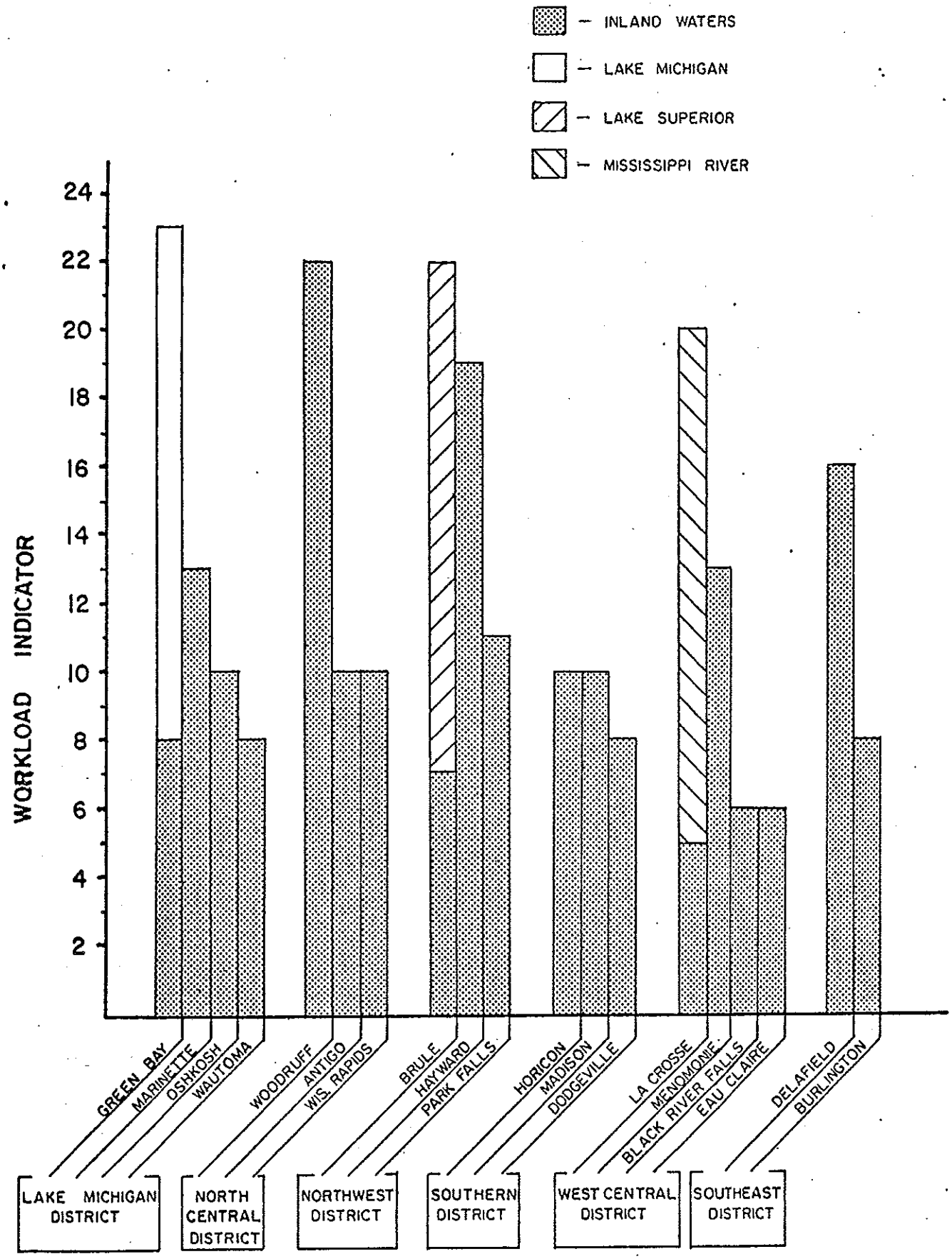
Results

Workload indicators are summarized for each area in Table 1. Figure 2 gives a graphical representation of Workload Indicators. Table 2 lists the percent of total potential workload by area and district.

As shown, highest workload figures appear in areas with high numbers of lakes and streams and large influxes of nonresidents, such as the Woodruff and Hayward areas. High figures are also achieved in areas with moderate amounts of water and high resident population, such as the Delafield area, and areas with high concentrations of trout streams, such as the Marinette area.

Workload Indicators can be used in comparison of areas. For example, the Woodruff area has approximately twice the potential workload of the Wisconsin Rapids area. These figures are not comparisons of actual work presently being accomplished; they simply indicate potential workload if waters in all areas were to receive equal management and we assume services increase proportionally with population.

FIGURE 2. WORKLOAD INDICATORS BY AREA



Take the hypothetical example of two areas which are identical except one area has twice the lakes of the other. If an equal time was spent surveying the lakes in each area, the lakes in one area would receive only half the attention of the lakes in the other area. The Workload Indicators were figured under the assumption that this type of unequal management would not occur.

Because of their size and relative uniqueness from a fisheries standpoint, Lake Michigan, Lake Superior and the Mississippi River were not included in the inland waters workload. All three have separate work units, although Lake Superior is under the jurisdiction of the Brule area, Lake Michigan is under the Green Bay area, and the Mississippi River is under the LaCrosse area. The work units conduct fisheries programs on these waters as well as monitor the sport and commercial fishery.

Based on current work unit manpower needs compared to inland areas in the state, each of these bodies of water was assigned a Workload Indicator of 15. This is a rather arbitrary assignment and is probably not wholly accurate, but puts each work unit on a general par with the areas.

Summary

The Workload Indicators assigned to areas in this report are a function of Service Requirement Indicators, based on population and area, and Resource Supply Indicators, based on amount of lakes, streams and trout streams. They do not indicate actual work being accomplished, nor do they indicate specific positions or man-months needed. The Workload Indicator is useful in comparing potential workload between areas, and may be helpful in determining where future manpower additions are needed.

RC:ew
2-18-74

Table 1. Workload Indicators by Area (excluding Lake Superior, Lake Michigan, Mississippi River)

	Lake Indicator	+ Stream Indicator	+ Trout Stream Indicator	= Resource Supply Indicator	+ Population Indicator	+ Area Indicator	= Service Requirement Indicator	Workload Indicator
NWD								
Hayward	30	8	5	11	16	7	8	19
Brule	6	6	6	4	4	5	3	7
Park Falls	12	5	10	7	4	7	4	11
Total	48	19	21	22	24	19	15	37
WCD								
Black River Falls	0	3	9	3	4	6	3	6
Eau Claire	6	4	3	3	4	5	3	6
LaCrosse	0	3	4	2	4	4	3	5
Menomonie	12	7	6	6	14	8	7	13
Total	18	17	22	14	26	23	16	30
NCD								
Antigo	8	7	9	6	6	6	4	10
Wisconsin Rapids	16	4	3	6	6	5	4	10
Woodruff	46	5	10	15	14	6	7	22
Total	70	16	22	27	26	17	15	42
LMD								
Green Bay	2	3	1	2	14	4	6	8
Marinette	8	8	21	9	4	8	4	13
Oshkosh	16	5	0	5	12	4	5	10
Wautoma	8	3	5	4	8	4	4	8
Total	34	19	27	20	38	20	19	39
SD								
Dodgeville	2	11	5	4	6	7	4	8
Horicon	12	12	1	6	8	4	4	10
Madison	6	3	2	3	16	5	7	10
Total	20	26	8	13	30	16	15	28
SED								
Delafield	4	2	0	2	40	3	14	16
Burlington	6	1	0	2	16	2	6	8
Total	10	3	0	4	56	5	20	24

Table 2. Percent of Total State Potential Workload by Area and District

	% (Including L. Superior L. Michigan & Mississippi R.)	% (Excluding L. Superior, L. Michigan & Mississippi R.)
NWD		
Hayward	7.7	9.5
Brule	9.0	3.5
Park Falls	4.5	5.5
Total	21.2	18.5
WCD		
Black River Falls	2.4	3.0
Eau Claire	2.4	3.0
LaCrosse	8.1	2.5
Menomonie	5.3	6.5
Total	18.2	15.0
NCD		
Antigo	4.1	5.0
Wisconsin Rapids	4.1	5.0
Woodruff	9.0	11.0
Total	17.2	21.0
LMD		
Green Bay	9.4	4.0
Marinette	5.3	6.5
Oshkosh	4.1	5.0
Wautoma	3.3	4.0
Total	22.1	19.5
SD		
Dodgeville	3.3	4.0
Horicon	4.1	5.0
Madison	4.1	5.0
Total	11.5	14.0
SED		
Delafield	6.5	8.0
Burlington	3.3	4.0
Total	9.8	12.0

RC:ew
2-19-74